THE OCCURRENCE OF APPLE BLOTCH IN OHIO.

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In the early part of September of this year there came an inquiry to the Department of Botany of the Ohio Agricultural Experiment Station from an orchard grower of Sharon, Noble County, seeking advice in regard to the blotched appearance of some of the apples found in his orchard. Examination of the specimens, by Mr. Arzberger, of this department, revealed the presence of the Apple Blotch, *Phyllosticta solitaria*, E. & E. This disease was reported by Scott* in 1909 as being quite prevalent in our southern states, causing a great deal of damage in the orchards infected. Investigations in the orchards in the vicinity of Wooster showed its presence on a local variety of apple known as "Butter Apple." All the trees of this variety in the orchard were infected to about sixty per cent of their crop, while other trees under similar conditions were immune.

Inquiries and inspection of the orchards in our southern counties revealed the fact that the apple blotch was quite prevalent in sprayed as well as unsprayed orchards. Usually one variety in an orchard suffers to a great degree while the remainder of the orchard is not infected. In one orchard, for instance, twenty barrels of Pippins were infected to about ninety per cent, while the other varieties were immune. The investigations in Lawrence, Gallia and Jackson Counties showed that *Phyllosticta solitaria* occurred frequently on Smith's Cider, Baldwin, Ben Davis, Stark, Pippin, and Rome Beauty. Often, as was the case with the Pippin, the entire crop was ruined by this disease. The disease has also been found in Wayne, Noble, and Athens Counties.

The fungus is not only found on the fruit, but its presence is also noted on the leaves and twigs; nevertheless, the disease is not suspected in the orchard unless the disease has made itself evident on the apples. The dark-brown stellar spots (Figs. 1 and 3),

* U. S. Bull. 144, Bureau of Plant Industry.

formed by the fungus are irregular in shape, varying from a quarter of an inch to an inch in diameter. However, they may coalesce and cover a larger portion of the apple. Not until the final stages does the fungus penetrate more than a few millimeters below the epidermis where it gives the infected portion a dry pulpy texture.

FIG. 1. Apple blotch (Phyllosticta solitaria), showing the nature of the disease.
FIG. 2. Pycnida of P. solitaria and sunken areas of infected tissue.
FIG. 3. A group of Smith's cider apples showing the typical blotches.
FIG. 4. Cankers of P. solitaria on apple twigs.

At the time the apples are about to be harvested the blotches are most prevalent and at this time the pycnidia begin to appear in the diseased spots below the epidermis (Fig. 2). They are not found in any definite position, but generally they are only seen in the older infected tissue at the center. In the mature pycnidia are found the one-celled, ovoid, hyaline spores varying somewhat but usually 9 x 6 microns. In certain cases we have transverse cracking of the infected areas which is soon followed by a general decay.

The fungus is also present on the water sprouts (Fig. 4) and fruit spurs where it forms tan-colored cankers. These cankers on the water sprouts are variable in size, often attaining a length of two inches, and a width of about one-half inch. The cankers on the fruit spurs are smaller, being usually about a quarter of an inch in diameter. However, the cankers are more numerous than on the water sprouts and often give the fruit spurs a very rough, ragged appearance due to the cracking of the cankered tissue. Sometimes the cracks may entirely separate the infected from healthy tissue, and then the canker wound will be healed by the growth of the new tissue which crowds away the infected bark. The pycnidia are found scattered over the entire canker surface and the spores therein are similar to those found on the fruit.

The leaves, when infected with *Phyllosticta solitaria*, show small yellow spots about a sixteenth of an inch in diameter. In the center of these irregular spots there usually can be found one or more pycnidia which contain the spores. The presence of the spots on the leaves are often lacking, especially when the foliage has been protected by proper spraying.

From the trees observed in this state, it is evident that very little infection comes from the infected leaves, but the perennial cankers on twigs, with their numerous pycnidia, are the great source of infection. The blotches, which give the apples their unsightly appearance, begin to appear late in July or in the early part of August and increase in size until harvesting (Fig. 2). These apples when kept in storage soon decay, because, through their injured epidermis other fungi enter.

As to the control of the apple blotch, it is reported by several of the fruit growers that spraying will control this disease. However, it has been observed that the blotch was prevalent to a great degree on certain trees that were well sprayed. The blotched apples in such cases would tend to discredit the use of sprays were it not for the fact that the trees were usually not well pruned, and hence the cankers were allowed to send forth their spores unhindered. It appears that spray treatment must extend throughout the season after the manner of sprays for bitter-rot. Thus it is clearly seen that while spraying is a great factor in the control of the apple blotch, pruning plays just as important a role in checking a disease which is costing many bushels of apples, and which, if not checked, will ruin some of the choice crops in this state.

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